



Attorney Docket No.: P-6170-US

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

*Handwritten signature/initials*

Applicant(s): ROSENBERG, Robert D. Examiner: Not yet known  
et al.

Serial No.: 10/722,587 Group Art Unit: 1623

Filed: November 28, 2003

Title: METHODS FOR SYNTHESIZING POLYSACCHARIDES  
12/28/2006 MARZ11 02200053 003335 10722587  
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Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**INFORMATION DISCLOSURE STATEMENT**

Pursuant to 37 C.F.R. §§1.56, 1.97 and 1.98, this Information Disclosure Statement includes Form PTO/SB/08:

1. ☒ listing documents including patents, publications and other information for consideration by the Examiner, however, since the subject application was filed after June 30, 2003, copies of United States patents and/or United States patent application publications are not included in this information disclosure statement; and/or
2. ☐ listing documents including patents, publications and other information that have been previously cited or submitted to the Patent Office in prior application U.S. Serial No. \_\_\_\_\_, filed \_\_\_\_\_ which is properly identified and relied on for an earlier effective filing date under 35 U.S.C. 120 for consideration by the Examiner; however, in accordance with 37 C.F.R. 1.98(d), copies of such documents are not included in this information disclosure statement; and/or
3. ☒ listing documents including patents, publications, and other information for consideration by the Examiner, copies of which are included with this information disclosure statement;
4. ☒ listing other information for the Examiner's consideration which was cited in a communication from a foreign patent office in a counterpart foreign application, a copy of which is included with this information disclosure statement.

APPLICANTS: ROSENBERG, Robert D., et al  
SERIAL NO.: 10/722,587  
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The information herein cited is only in fulfillment of Applicant(s) duty of candor in disclosing all information brought to Applicant(s) attention. This submission does not represent that a search has been made or that no better art exists and does not constitute an admission that each or all of the listed documents are material or constitute "prior art". If it should be determined that any of the listed documents do not constitute "prior art" under United States law, Applicant(s) reserve the right to present to the office the relevant facts and law regarding the appropriate status of such documents.

Applicant(s) further reserve(s) the right to take appropriate action to establish the patentability of the disclosed invention over the listed documents, should one or more of the documents be applied against the claims of the present application.

In accordance with MPEP Sections 609 and 707.05(b), it is requested that each and every document cited (including any cited in applicant's specification which is not repeated on the attached Form PTO-1449) be given thorough consideration and that it be cited of record in the prosecution history of the present application by initialing on Form PTO-1449. Such initialing is requested even if the Examiner does not consider it to be prior art for any reason, or even if the Examiner does not believe that the guidelines for citation have been fully complied with. This is requested so that each document becomes listed on the face of the patent issuing on the present application and is evidence that the Examiner has considered the document.

This Information Disclosure Statement is being filed:

I) ☐ Within three (3) months of filing the subject Application or entry of the subject Application into the national stage or before mailing of the first Office Action on the merits of the subject Application or a request for continued examination thereof, whichever event occurs last pursuant to of 37 C.F.R §1.97 (b); or

II) ☐ After the period specified in (I) but before the mailing date of either a final Official Action under 37 C.F.R §1.113 or a notice of allowance under 37 C.F.R §1.311 whichever occurs first and;

1. ☐ the undersigned hereby states that each item of information listed on the Form PTO-1449 was either (i) cited in a communication from a foreign patent office in a counterpart foreign application not more than three (3) months prior to the filing of this Information Disclosure Statement or (ii) not cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, not known to any individual designated in §1.56(c) more than three (3) months prior to the filing of this information disclosure statement; or

2. ☒ the undersigned hereby authorizes the Patent Office to charge the fee in the amount of \$180.00 under 37 C.F.R. §1.17 (p) to Deposit Account 50-3355.

III) ☐ After the period in (I) and (II) but before the payment of the issue fee and,

1. The undersigned hereby states:

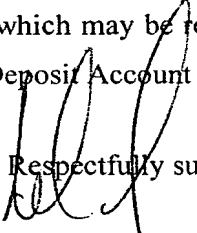
a) ☐ that each item of information cited on the form PTO-1449 was cited in a communication from a foreign Patent Office in a counterpart foreign application not more than three (3) months prior to the filing of this Information Disclosure Statement; or

b) ☐ that no items of information contained in Form PTO-1449 was cited in a communication from a foreign patent office in a counterpart foreign application, and to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Information Disclosure Statement was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this Information Disclosure Statement; and

2. ☐ The undersigned hereby authorizes the Patent Office to charge the Petition fee in the Amount of \$180.00 under 37 C.F.R. §1.17 (p) to Deposit Account 50-3355.

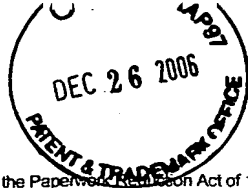
**Except** for issue fees payable under 37 C.F.R. §1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account No. 50-3355.

Respectfully submitted,

  
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Mark S. Cohen  
Attorney/Agent for Applicant(s)  
Registration No. 42,425

Dated: December 26, 2006

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PTO/SB/08a (07-05)

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<b>Substitute for form 1449A/PTO</b>  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)				<b>Complete if Known</b>	
				Application Number	10/722,587
				Filing Date	November 28, 2003
				First Named Inventor	ROSENBERG, Robert D.
				Art Unit	1623
				Examiner Name	Not yet known
Sheet	1	of	3	Attorney Docket Number	P-6170-US

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
	A	US-2004/0043447	04-03-2004	SARIBAS, et al	
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FOREIGN PATENT DOCUMENTS							
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup>	Number <sup>4</sup> Kind Code <sup>5</sup> (if known)				
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The collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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				Application Number	10/722,587
				Filing Date	November 28, 2003
				First Named Inventor	ROSENBERG, Robert D.
				Art Unit	1623
				Examiner Name	Not yet known
Sheet	2	of	3	Attorney Docket Number	P-6170-US

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (where appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	B	Aikawa, et al (2001) "Multiple isozymes of heparan sulfate/heparin GlcNAc N-deacetylase/GlcN N-sulfotransferase. Structure and activity of the fourth member, NDST4." J. Biol. Chem. 276: 5876-82	<input type="checkbox"/>
	C	Habuchi, et al (2000) "The occurrence of three isoforms of heparan sulfate 6-O-sulfotransferase having different specificities for hexuronic acid adjacent to the targeted N-sulfoglucosamine." J. Biol. Chem. 275: 2859-68	<input type="checkbox"/>
	D	Kovensky, et al (1999) "A synthetic heparan sulfate pentasaccharide, exclusively containing L-iduronic acid, displays higher affinity for FGF-2 than its D-glucuronic acid-containing isomers." Bioorg. Med. Chem. 7: 1567-80	<input type="checkbox"/>
	E	Kuberan, et al (2002) "Analysis of heparan sulfate oligosaccharides with ion pair-reverse phase capillary high performance liquid chromatography-microelectrospray ionization time-of-flight mass spectrometry." J. Am. Chem. Soc. 124: 8707-18	<input type="checkbox"/>
	F	Leali, et al (2001) "Fibroblast growth factor-2 antagonist activity and angiostatic capacity of sulfated Escherichia coli K5 polysaccharide derivatives." J. Biol. Chem. 276: 37900-08	<input type="checkbox"/>
	G	Lemieux, et al (1979) "The azidonitration of tri-o-acetyl-D-galactal" Can. J. Chem. 57: 1244-51	<input type="checkbox"/>
	H	Li, et al (1977) "Biosynthesis of Heparin/Heparan Sulfate" J. Biol. Chem. 272(44): 28158-63	<input type="checkbox"/>
	I	Shaklee, et al (1984) "Hydrazinolysis of heparin and other glycosaminoglycans." Biochem. J. 217: 187-97	<input type="checkbox"/>
	J	Toshima and Tatsuta (1993) Chem. Rev. 93: 1503-31	<input type="checkbox"/>
	K	Orellana, A., et al (1994) "Molecular cloning and expression of a glycosaminoglycan N-acetylglucosaminyl N-deacetylase/N-sulfotransferase from a heparin-producing cell line." J Biol Chem 269, 2270-6	<input type="checkbox"/>
	L	Lloyd, A.G., et al (1971) "Embery, G. & Fowler, L.J. Studies on heparin degradation. I. Preparation of ( 35 S) sulphamate derivatives for studies on heparin degrading enzymes of mammalian origin." Biochem Pharmacol 20, 637-48	<input type="checkbox"/>
	M	Campbell, P. et al. (1994) "Biosynthesis of heparin/heparan sulfate. Purification of the D-glucuronyl C-5 epimerase from bovine liver." J Biol Chem 269, 26953-8	<input type="checkbox"/>

Examiner Signature	Date Considered
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Sheet	3	of	3	Attorney Docket Number	P-6170-US

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	N	PIKAS, et al (1999) "Enzymes involved in biosynthesis and degradation of heparin-related polysaccharides, Trends in Glycoscience and Glyotechnology, vol. 11 no. 61 303-308.	<input type="checkbox"/>
	O	KUSCHE, et al (1991) "Biosynthesis of heparin. Use of Escherichia coli K5 capsular polysaccharide as a model substrate in enzyme polymer-modification reactions, Biochemical Journal vol. 275 no. 1 151-158.	<input type="checkbox"/>
	P	FORSBERG, et al (1999) "Abnormal mast cell in mice deficient in a heparin-synthesizing enzyme, Nature vol. 400 no. 6746 773-776.	<input type="checkbox"/>
	Q	HERNAIZ, et al (*2000) "Enzymatic modifications of heparan sulfate on a biochip promotes its interaction with antithrombin III, BBRC vol. 276 no. 1 292-297.	<input type="checkbox"/>
	R	PEJLER, et al (1987) "Structure and affinity for antithrombin of heraoan sulfate chains derived from basement membrane proteoglycans. J Biol Chem vol 262 no. 1 5036-5043.	<input type="checkbox"/>
	S	Camejo, et al (1992) "Binding of Low Density Lipoproteins by Proteoglycans Synthesized by Proliferating and Quiescent Human Arteial Smooth Muscle Cells." The Journal of Biological Chemistry. 14131-14137.	<input type="checkbox"/>
	T	Galanina, et al (1998) "Determination of Carbohydrate Specificity of Monoclonal Antibodies against MUC1." Tumor Biol. 79-87.	<input type="checkbox"/>
	U	Van den Born, et al (1995) "Presence of N-Unsubstituted Glucosamine Units in Native Heparan Sulfate Revealed by Monoclonal Antibody." The Journal of Biological Chemistry 31303-31309.	<input type="checkbox"/>
	V	Zhou, et al (1997) "Heparin-dependent Fibroblast Growth Factor Activities: Effects of Defined Heparin Oligosaccharides." European Journal of Cell Biology 71-80.	<input type="checkbox"/>
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